



## Thailand

### PROPOSAL FOR PRELIMINARY APT COMMON PROPOSALS ON WRC-19 AGENDA ITEMS 1.2 1.3 AND 1.7

#### Agenda Item 1.2:

*“to consider in-band power limits for earth stations operating in the mobile-satellite service, meteorological-satellite service and Earth exploration-satellite service in the frequency bands 401-403 MHz and 399.9-400.05 MHz, in accordance with Resolution 765 (WRC-15)”*

#### 1. Background

Taking into account the results of ITU-R studies, the objective of WRC-19 agenda item 1.2 is to consider establishing, within the Radio Regulation, in-band power limits applicable to earth stations transmissions in the frequency bands 399.9-400.05 MHz and 401-403 MHz in order to ensure the operation of existing and future systems that usually implement low or moderate output powers for mobile-satellite service (MSS), Earth exploration-satellite service (EESS) and meteorological satellite service (MetSat) systems.

Report ITU-R SA.2430-0 compiles elements related to background on WRC-19 agenda item 1.2 as well as technical considerations on MSS, EESS and MetSat and associated space operation functions according to RR No. **1.23** in the frequency ranges of 399.9-400.05 MHz and 401-403 MHz bands.

This Report includes an analysis section providing guidance to derive the possible e.i.r.p. (equivalent isotropically radiated power) and e.i.r.p. density limits under this agenda item while recognizing that some current and planned systems using space operation functions, according to RR No. **1.23** in these bands will not be able to comply with a given set of limits.

For the band 399.9-400.05 MHz, four different methods are proposed.

For the band 401-403 MHz, three different methods are proposed.

#### 2. Views and Proposals

Thailand supports establishing in-band power limits for earth stations in the EESS and MetSat in the frequency band 401-403 MHz and the MSS in the frequency band 399.9-400.05 MHz by adding a new footnote in the Table of Frequency Allocations in RR Article 5, in order to ensure the operation of existing and future systems that usually implement with low or moderate output powers for MSS, EESS and MetSat systems.

Therefore, Thailand supports Method C (399.9-400.05 MHz) for and Method E (401-403 MHz) of the CPM report.



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## Agenda Item 1.3:

*“to consider possible upgrading of the secondary allocation to the meteorological-satellite service (space-to-Earth) to primary status and a possible primary allocation to the Earth exploration-satellite service (space-to-Earth) in the frequency band 460-470 MHz, in accordance with Resolution 766 (WRC-15)”*

### 1. Background

Taking into account the results of studies, this agenda item aims at determining the possibility of upgrading the secondary meteorological-satellite service (MetSat) (space-to-Earth) allocation to primary status and adding a primary Earth exploration satellite-service (EESS) (space-to-Earth) allocation in the frequency band 460-470 MHz. This has to be performed while providing protection and not imposing any additional constraints on existing primary services to which the frequency band is already allocated and in the adjacent frequency bands as well as maintaining the conditions contained in RR No. 5.289. Resolution 766 (WRC-15) also states that future MetSat (space-to-Earth) and EESS (space-to-Earth) earth stations will not claim protection from stations in the fixed and mobile services. Since Malaysia and Thailand have allocated the frequency band 450 MHz to 470 MHz for IMT, it is crucial to ensure that mobile service is protected and no additional constraint is imposed to it.

The new ITU-R Report SA.2429 provides the studies and compiles elements related to background on WRC-19 agenda item 1.3 as well as technical considerations on EESS and MetSat in the 460-470 MHz band and potential interference to incumbent systems operating under allocation to primary services in this band and adjacent bands (450-460 MHz in all regions and 470-585 MHz in Region 3), including systems in the mobile, maritime mobile, mobile satellite, fixed, and broadcasting services. In addition, the power flux density (pfd) criteria determined by the studies will be no less restrictive than  $-152 \text{ dB (W/m}^2\cdot\text{4kHz)}$  for all angles of arrival from EESS and MetSat spacecrafts in order to protect incumbent in-band and adjacent channel service operations. In the study for IMT mobile station systems, the mobile service narrowband mobile station antenna was modelled as omnidirectional, whereby the pfd level was determined to be less restrictive than  $-152 \text{ dB (W/(m}^2\cdot\text{4kHz))}$ . Therefore, IMT systems are protected and will not be constraint for its development.

### 2. Views and Proposals

Since the studies contained in the ITU-R Report SA.2429 has determined the pfd limits for both non-GSO and GSO MetSat and EESS satellites in the frequency band 460-470 MHz which will ensure the protection of incumbent primary allocated services in this band and adjacent bands, Thailand supports the proposal to upgrade the allocation for MetSat (space-to-Earth) from secondary to primary status and addition of primary allocation for EESS (space-to-Earth) in the frequency band 460-470 MHz, provided that the priority of MetSat over EESS is retained as currently contained in the Radio Regulations and earth stations in the MetSat (space-to-Earth) and EESS (space-to-Earth) shall not cause interference to nor claim protection from stations of the fixed and mobile services.

Therefore, Thailand supports Method C of the CPM report.



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## **Agenda Item 1.7:**

*“to study the spectrum needs for telemetry, tracking and command in the space operation service for non-GSO satellites with short duration missions, to assess the suitability of existing allocations to the space operation service and, if necessary, to consider new allocations, in accordance with Resolution 659 (WRC-15)”*

### **1. Background**

In accordance with Resolution **659 (WRC-15)**, ITU-R has performed studies on spectrum needs for telemetry, tracking and command (TT&C) in the space operation service (SOS) for non-GSO satellites with short duration (non-GSO SD) missions, to assess the suitability of existing allocations to the SOS and, if necessary, to consider possible new allocations.

Typical non-GSO SD TT&C technical parameters were developed for use in the studies.

The studies show that the amount of spectrum required for non-GSO SD systems is 0.682 MHz to 0.938 MHz for non-GSO SD earth station uplink (depends on scenario) and 0.625 MHz to 2.5 MHz for non-GSO SD satellite downlink (depends on scenario).

Furthermore, technical and regulatory studies including sharing studies were carried out.

Four methods and associated regulatory texts were developed to satisfy this agenda item. Methods B1 and B2 propose a new allocation (see Resolution **659 (WRC-15) invites 3**) and Method C proposes to use existing allocations (see Resolution **659 (WRC-15) invites 2**):

- Method A proposes no change to the Radio Regulations;
- Method B1 proposes a new SOS (Earth-to-space) allocation for non-GSO SD systems in the frequency range 403-404 MHz;
- Method B2 proposes a new SOS (Earth-to-space) allocation for non-GSO SD systems in the frequency range 404-405 MHz;
- Method C proposes to use the SOS allocation in the frequency band 137-138 MHz for downlink and the band 148-149.9 MHz for uplink and to provide appropriate associated regulatory provisions in the Radio Regulations for telecommand links of non-GSO SD missions.

### **2. Views and Proposals**

Thailand is of the view that protection of existing services is necessary and any new allocations or upgrades of existing allocations to the space operation service should be applied without any constraint to the incumbent services including their current and planned use, both in-band as well as adjacent bands.

Therefore, Thailand supports Method B2 of the CPM report and not supports Method C of the CPM report.



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